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Towards a Framework for Real-Time Requirements Elicitation

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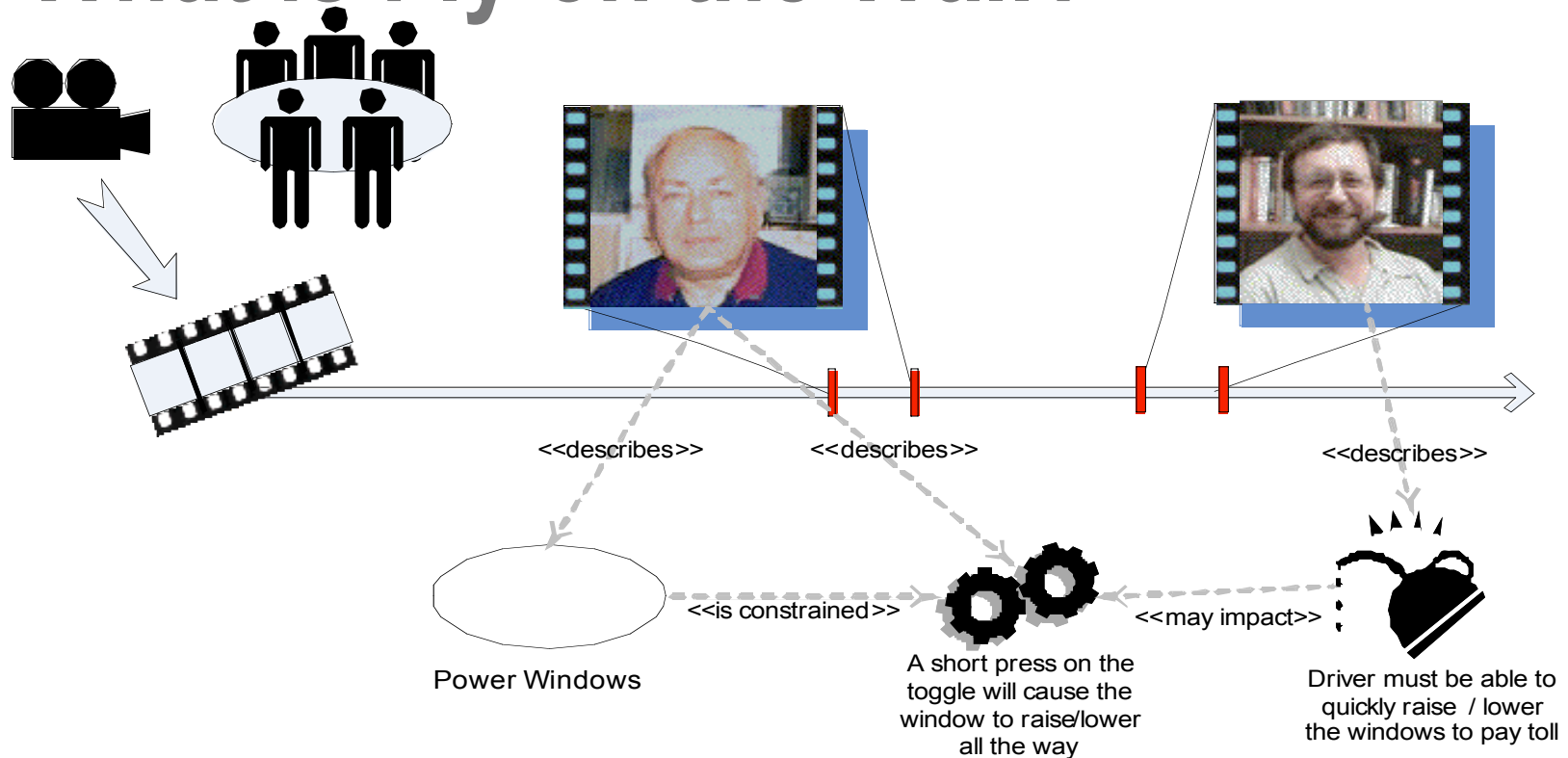
Technische Universität München

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The Problem

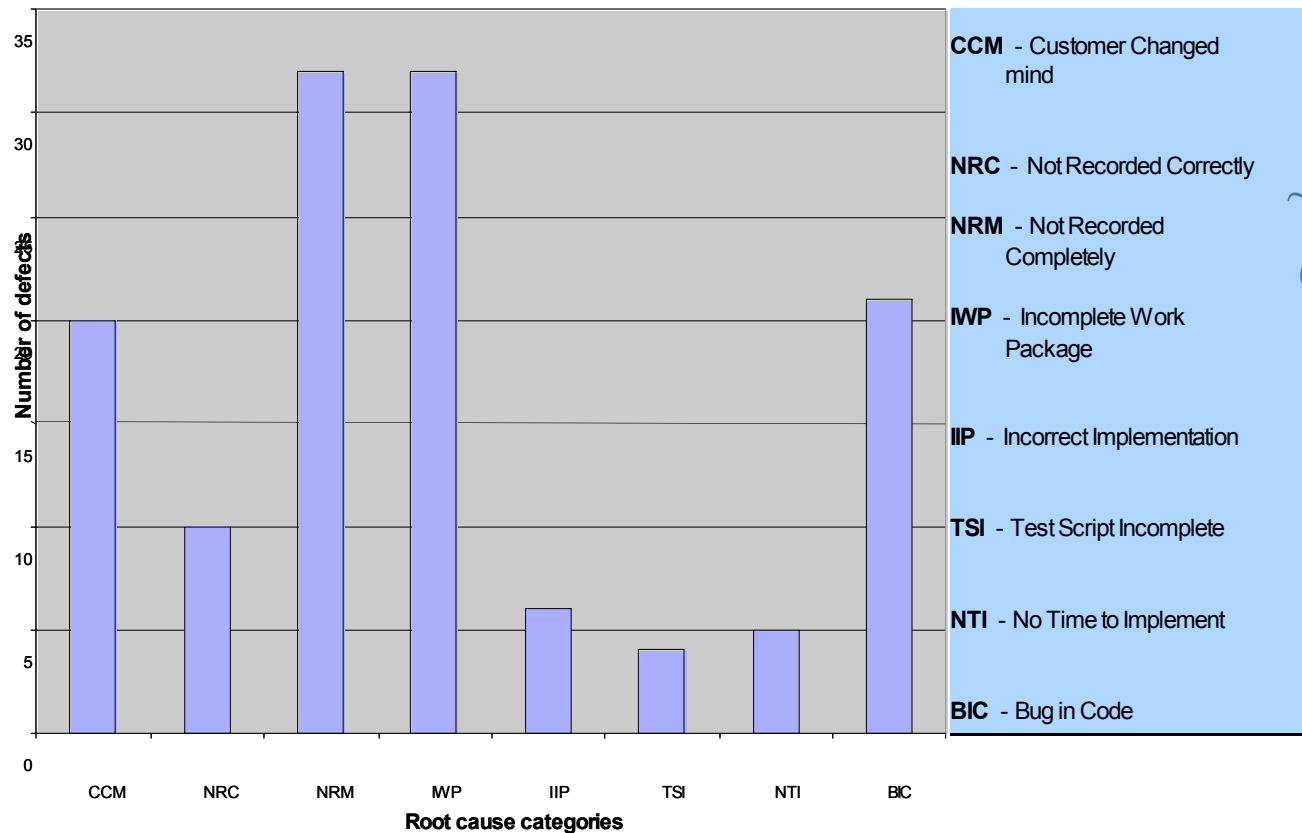
- ❑ **Loss Of Context From Elicitation To Development**
- ❑ **Missing Traces Back To Stakeholder.**

What is Fly on the Wall?



Motivation for Fly on the Wall

Distribution of 85 release defects by root cause



~ 40% of defects
due to incorrect
recorded
requirements

Impact of Organizational Structure on Distributed Requirements Engineering Processes: Lessons Learned, GSD First International Workshop on Global Software Development for the Practitioner, 2006

Benefits

- ❑ Original stakeholder requests become part of project knowledge base
- ❑ Video clips provide more context than pure transcripts
 - ❑ body language, way of speaking, train of reason, discussion dynamics
- ❑ Meeting record is complete and correct
- ❑ Rationale for the Requirements is available
 - ❑ Who introduced this requirement?
 - ❑ Why was the requirement introduced?
 - ❑ When was this requirement introduced?
 - ❑ etc...

Envisioned Scenarios 1

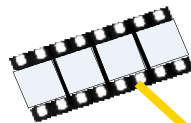
- Focus Group Meeting in a hospital

If somebody with a serious injury is hospitalized, we immediately have to take care of that



When updating a patient record, do nurses get interrupted? And why?

Captured meeting record, split into requirement clips



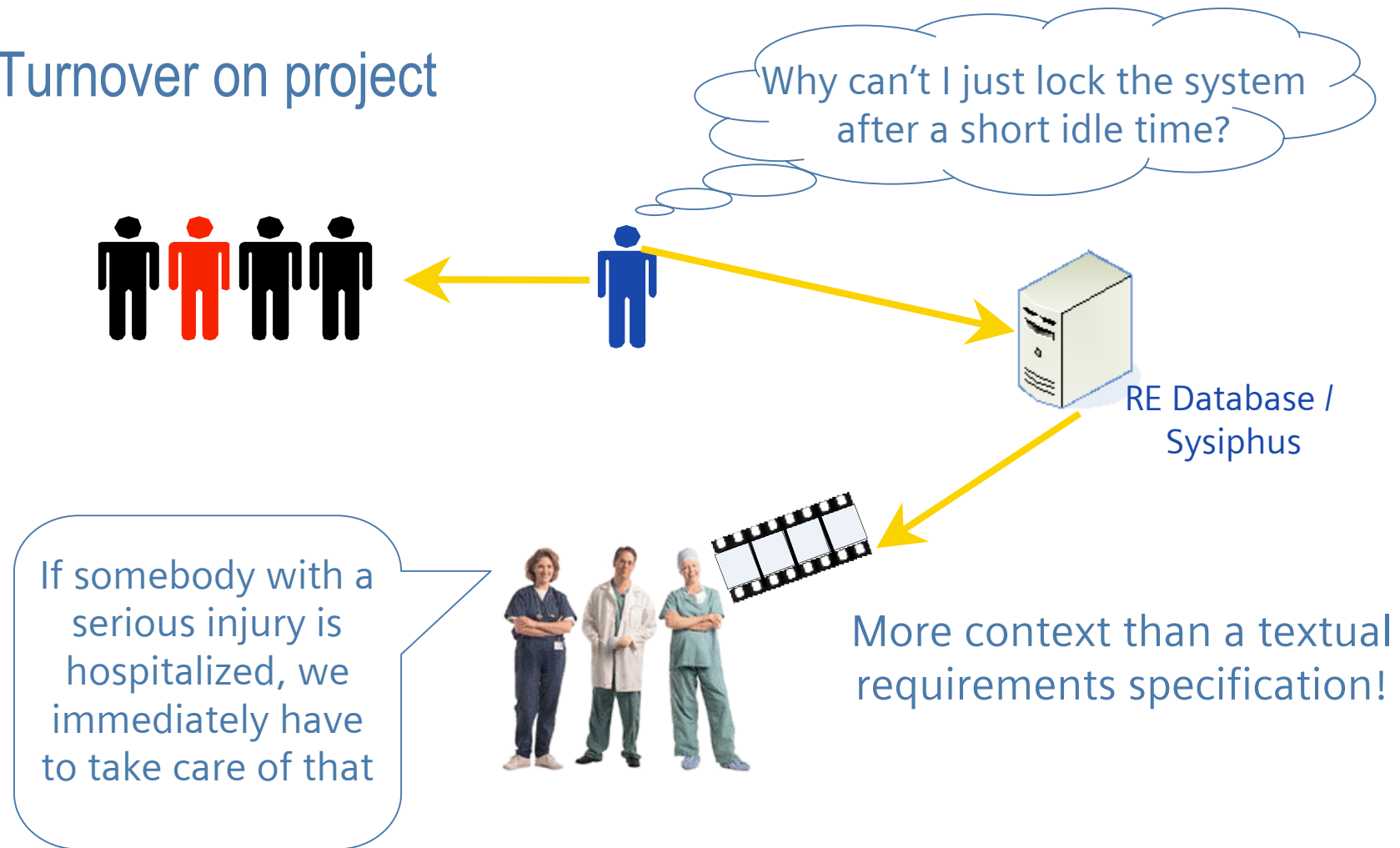
RE Database / Sysiphus



Developer in China

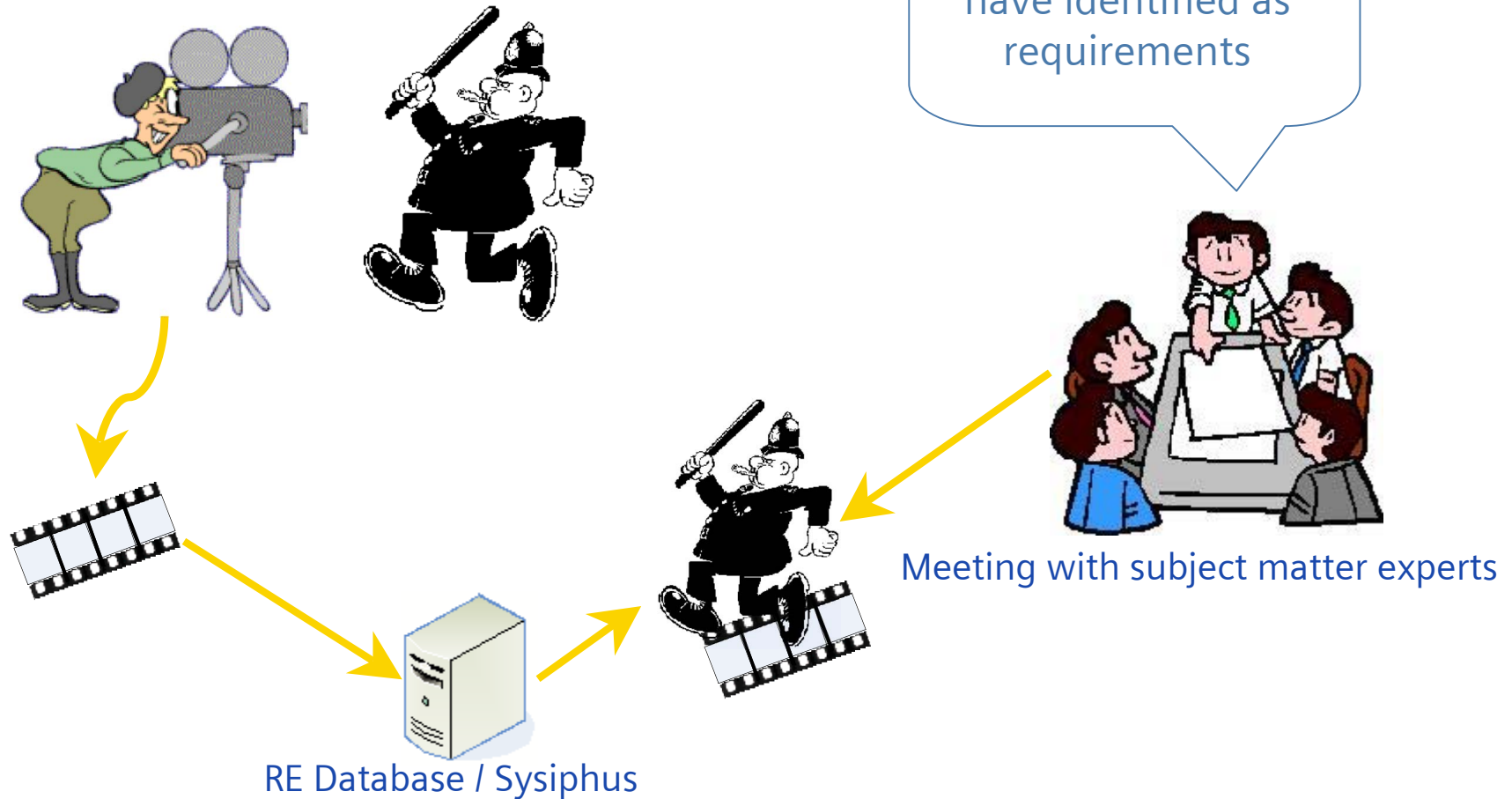
Envisioned Scenarios 2

- Turnover on project



Envisioned Scenarios 3

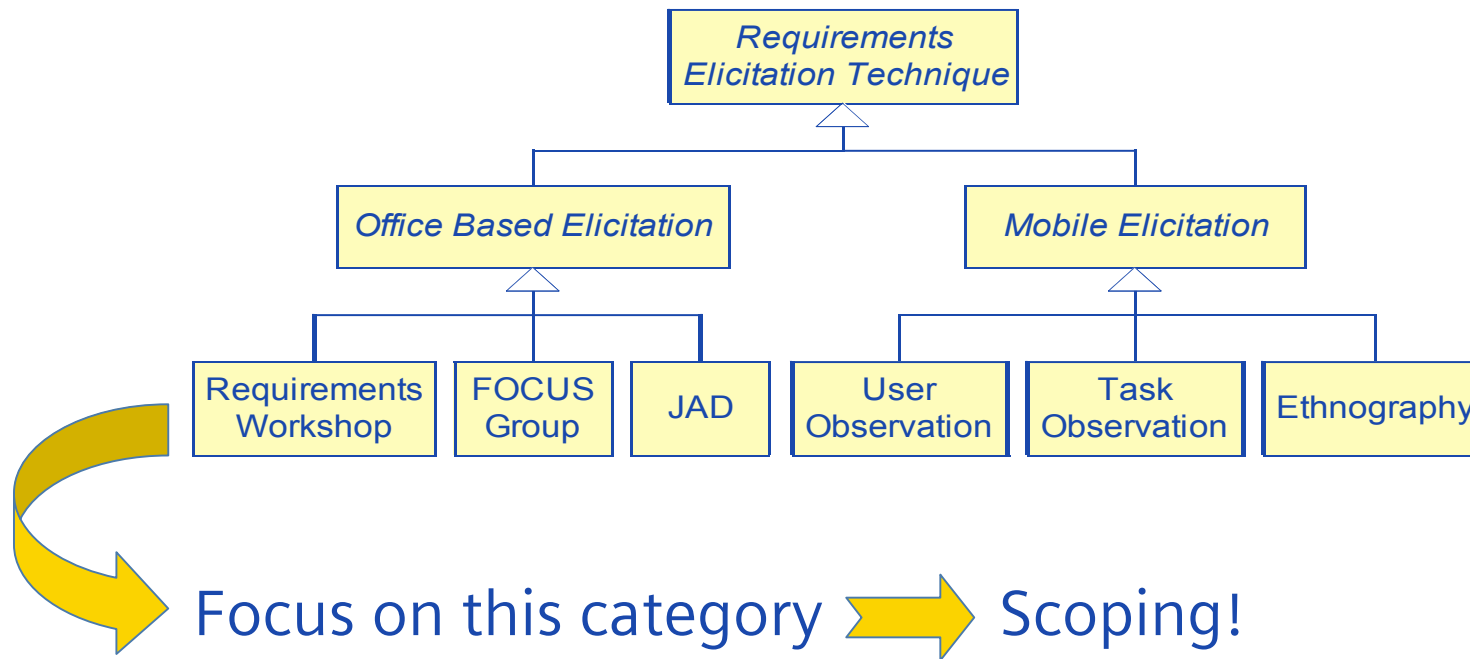
- Following a 'blue collar' worker



Requirements Elicitation Taxonomy

- Why do we need a Taxonomy?
 - Support multiple Elicitation Techniques
- Which differences are important (for us)?
 - Mobility
 - Expected kind of raw requirements
 - Structure of meetings

Requirements Elicitation Taxonomy



Statement Extraction

Goal

- Extract raw requirements from the video record automatically in real time

Motivation

- Nobody wants to watch a 2 hour meeting video
- Considerable effort for post-processing decreases practical benefit of the system
- Multiple short clips are easier to access than one long record (searching, browsing).

What needs to be done?

- Mark beginning and end of a raw requirement
- Annotate the video with additional information
 - Speaker, Topic, Keywords, Additional Notes

Technical Issues:

- Total distraction from the meeting when adding information
- Automatic generation of annotations
 - Although possible for most items, this is out of scope for now
- How to generate the markings automatically?

Structures of Requirements Elicitation Meetings

- Some Meetings follow structures (agenda, presentation)
- Structures are not followed strictly!
- ➔ Inherent structuring probably not suitable for automatic processing
- ➔ Impose a structuring on the meeting, that does disturb the group dynamics but is suitable for automatic processing

Solutions

- Basic Solution
 - Set markings manually
 - Allow correction of markings (during meeting and afterward)
- More Sophisticated
 - Set marking manually, but use automatic correction, e.g. move it to the point when the current speaker started talking
- More Intrusive
 - Use a small grammar of keywords, a trained facilitator and a speech recognition system
- Other?

Hardware

- What requirements do we have?
 - Depends on the supported Elicitation Techniques
 - Transportability
 - Low Setup Time/Personnel Expense
 - Partially standalone
 - ~40 hours of video throughout a project
- Can we meet those requirements?
 - Yes, we can!

SIEMENS CORPORATE RESEARCH



- Video Capture capability (MPEG-4) with stereo sound
- Internal memory for 90 minutes video capturing in 'DVD-similar' quality
- Extensible with memory cards up to 2GByte (internal = 50MByte).

Hardware for Office Based Elicitation

4 Possibilities

- Single static camera
- Single moving camera
- Multiple cameras
- Omni directional camera.

Omni Directional Cameras

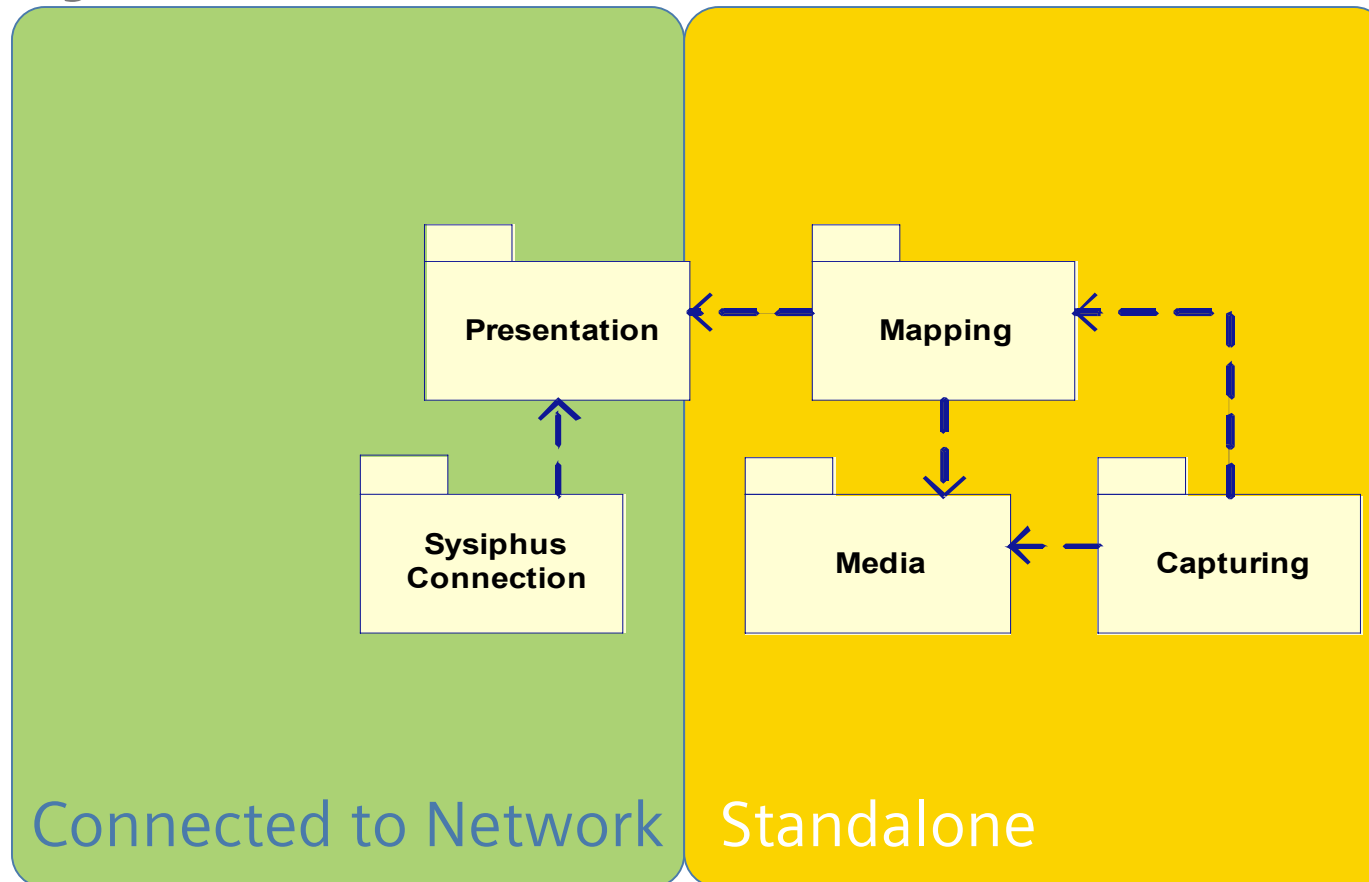
Using a mirror



Camera Array



System Architecture



Sisyphus

- Designed for Collaboration in Distributed Environments
- Modeling Tool
- One repository for all artifacts
- More information:
 - <http://sysiphus.in.tum.de/>

Summary

- ✓ Improve requirements elicitation process
- ✓ Provide correct and complete meeting records
- ✓ Bridge the gap between developer and customer
- ✓ Provide Rationale for Design Decisions

Next Steps

- ✓ Add MPEG-7 Annotations
- ✓ Add support for an omni directional camera
- ✓ Integrate speech recognition system
- ✓ Add Browsing and Searching Interface

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Questions?